

SCIENTISTS AND POLITICIANS: THE ART OF THE IMPOSSIBLE

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This week, President Obama announced guidelines for “Scientific Integrity” in his administration. At the White House that day was Nobel laureate Harold Varmus, the former Director of the National Institutes of Health who now co-chairs the President’s Council of Advisors on Science and Technology. As Varmus told *The New York Times*, “Scientists should have no illusions about whether they make policy -- they don’t.”¹

His view echoes the conventional wisdom that in Washington scientists should be “on tap, not on top.” And for those few scientists who first tried to make nuclear weapons policy, at the dawn of the atomic age, their results were frustrating -- but not entirely fruitless. One important lesson from the last 70 years is that scientists can often be most effective not by joining the policy process directly but by creating institutions that affect outcomes obliquely.

More than any other scientist, Leo Szilard lived both sides of the arms race, working first to prevent, then to hasten, and finally to outlaw nuclear weapons. His efforts offer a cautionary tale about how the scientific method and the political process differ.

Szilard fled Hitler’s Germany in 1933 and that year first conceived the nuclear “chain reaction” and the “critical mass” to start and sustain it. This he kept secret, lest Nazi scientists use this insight to make bombs. He also urged fellow physicists, including Enrico Fermi, to self-censor their research. But six years later, once German scientists had fissioned the uranium atom, Szilard enlisted Fermi, Albert Einstein, and others to race Hitler to the bomb. In 1939 he co-designed the world’s first nuclear reactor with Fermi, and drafted for Einstein the letter to President Roosevelt that led to America’s A-bomb.

Szilard also helped organize research that eventually became the Manhattan Project, although once in the Army chain of command he and other nuclear pioneers soon lost control and influence. It didn’t help that while Szilard enjoyed “baiting brass hats” his nemesis, project director Gen. Leslie R. Groves, came to consider the scientists “crackpots.”²

Like other nuclear scientists, Szilard was ambivalent about his mission. In January 1944, he wrote to Vannevar Bush, the A-bomb project's civilian director, recommending schemes for post-war international control. In what may be the first suggestion of a preemptive war to prevent the spread of nuclear weapons, Szilard urged seizing all the world's uranium "if necessary by force, and it will hardly be possible to get political action along that line unless high efficiency atomic bombs have actually been used in this war and the fact of their destructive power has deeply penetrated the mind of the public."³ Ironically, Szilard feared that the bomb he did not want to use to win the war must be used to win the peace.

Two months later, in March 1944, Szilard came to Bush's office – in this building – for an all-day conversation about international controls. Their meeting stimulated Bush, and his colleague James B. Conant, to propose control policies to President Roosevelt.⁴ FDR (and before him British Prime Minister Winston Churchill) had heard similar appeals that summer from Danish physicist Niels Bohr, who urged a new international order to avert a post-war nuclear arms race.⁵

Historian Martin Sherwin has noted, "It was natural that many scientists came to believe that they, themselves, rather than the military, bore the ultimate responsibility for victory and the security of the nation."⁶ Szilard, in particular, believed scientists had rational powers that could clarify public policy issues, and he eagerly offered his own "sweet voice of reason" to anyone who would listen. But few in power did.

In March 1945, Szilard drafted another Einstein letter to FDR, this time urging the President to meet Szilard about post-war controls. FDR died before receiving it, so Szilard sent the letter and a policy memo to President Truman, who asked Szilard to visit James F. Byrnes in South Carolina. (Byrnes was then Truman's representative on a secret committee deciding US policies for the A-bomb and would soon be named Secretary of State.) Szilard took along chemist Harold Urey, a Nobel laureate who had devised the gaseous-diffusion method to separate fissionable uranium, and who had quit the Manhattan Project that spring -- once it was clear Germany was defeated. This meeting brought together scientists who had made the bomb and wanted to stop it with the politician who most wanted to use it. We know the outcome.

Frustrated by this meeting Szilard returned to Chicago and helped draft a report to the Secretary of War by a committee of Manhattan Project scientists headed by James Franck, a Nobel laureate in physics. This urged demonstrating the bomb and seeking its international control.⁷ But Szilard's fellow scientists on Byrnes's committee – including Fermi and J. Robert Oppenheimer -- advocated a surprise attack on Japanese cities, the policy that prevailed.⁸

In July 1945, two weeks before the A-bomb was first tested, Szilard organized a petition to the President urging moral considerations and specific surrender terms for Japan. In all, 155 Manhattan Project scientists signed, but General Groves saw to it that the petition was delayed and it never reached the President before Hiroshima and Nagasaki were destroyed in August.

When Szilard tried to publish the petition in September General Groves had it classified. It was not de-classified and published until the 1960s. This led Szilard to conclude that the most powerful weapon to come from the Manhattan Project was not the A-bomb but the "SECRET" stamp.

In September 1945, Franck tried a petition of his own, enlisting 65 University of Chicago faculty in urging the President to share nuclear secrets as a way to avoid an arms race. This many politicians considered naïve. But more practically, Franck, Szilard, and others at Chicago founded the *Bulletin of the Atomic Scientists* to educate the public and politicians about the perils created by nuclear weapons, and its "Doomsday Clock" has measured the arms race ever since.

In the fall of 1945, Szilard rallied fellow scientists to lobby for civilian control of atomic energy, as a way to assure other governments that international control would be for peaceful purposes. But when a civilian Atomic Energy Commission was created in 1947 its independence from the Pentagon was undermined by a statutory Military Liaison Committee that came to dominate weapons policy.

Never ceasing to arrange direct contact with scientists and politicians, Szilard in 1951 met in Chicago with *Bulletin* editor Eugene Rabinowitch and the English nuclear physicist Josef Rotblat. There the three proposed arms-control discussions directly with visiting Soviet scientists.⁹ At the time the Soviets demurred, but the idea finally gained force in 1955 with a manifesto signed by Albert Einstein and Bertrand Russell, calling on scientists to resist militarism. This led to the Pugwash Conferences on Science and World Affairs, begun in 1957 (at a Nova Scotia village of that name) and conducted ever since. Harvard physicist John Holdren, who headed Pugwash in 1995 when it – and Rotblat -- received the Nobel Peace Prize, has been named President Obama's Science Advisor. Over the years, Pugwash has been credited for many back-channel negotiations, and for some arms-control agreements.

Through Pugwash Szilard met many Soviet scientists and ironically had a decisive influence. In 1947, he wrote an open letter to Stalin urging nuclear restraint and proposing radio broadcasts to each others' citizens by US and Soviet leaders. The same year, Szilard wrote his political satire "My Trial as a War Criminal" to dramatize that scientists are responsible for their creations. When this story was republished in 1961, the Soviet nuclear physicist Viktor Adamsky read it, then translated it for his colleague Andrei Sakharov. According to Richard Rhodes, Sakharov took Szilard's responsibilities to heart and began his own courageous crusade to halt the arms race he had so brilliantly advanced, ultimately receiving the Nobel Peace Prize in 1975.¹⁰

Forsaking letters and petitions, Szilard decided to engage Congress directly in 1962, applying his "critical mass" concept to political fundraising. He founded the Council for a Livable World, the first political action committee for arms control. The Council bundled thousands of donations and directed them to key races that candidates favoring arms control might win. (His first candidate was South Dakota Senator George McGovern, a choice made because while all Senators have a vote on arms-control treaties those from sparsely populated states need less money.) Since then Council has helped elect 118 pro-arms-control candidates to the Senate, and 199 to the House. In 2008, more than 40,000 members donated \$1.1 million.

Throughout the Cold War, policy debates continued about whether and how to test nuclear weapons,

and scientists led by chemist Linus Pauling and others roused the public and lobbied politicians to enact test-ban treaties. Szilard's contrary nature at first confused some colleagues on this issue when he said he *avored* testing nuclear weapons. Then they learned why. "Test them!" Szilard urged. "Test them *all!*"¹¹

Speaking in December 1945, Szilard challenged an audience of distinguished scientists and politicians about their uneasy relationship, highlighting a fundamental difference that helps explain Harold Varmus's remark. In words worth remembering today, Szilard said scientists should *not* emulate politicians; in fact, just the opposite should occur. Conceding that while politics is "the art of the possible," Szilard said science "might be defined as the art of the impossible. The crisis which is upon us may not find its ultimate solution until the statesmen catch up with the scientists and politics, too, becomes the art of the impossible."¹²